

POLLUTION PREVENTION MYTHS ABOUT PAINTING AND PAINT STRIPPING

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In Pollution Prevention or Waste Reduction assessment reports and case studies, the following statements appear quite frequently:

- "...and the company should change to water based paints which will eliminate the hazardous waste from their coating operation."
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- "The switch to water based paints reduced their VOC emission to zero."
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- "The lead-free paint does not produce a sludge with heavy metals."
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- "The equipment is now stripped prior to re-coating by blasting with [plastic beads or dry ice or ice crystals or baking soda or take your pick] which completely eliminated the operation's hazardous waste."
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- "The switch to powder coatings reduced their VOC emissions to zero."
- "Stripping the paint with this non-hazardous chemical stripper will eliminate the need to dispose of the paint sludge as a hazardous waste."

The above statements are mostly untrue !!!

WATER BASED PAINTS

Water based paints contain from about 30 g/l (.25 lb/gal) to 250 g/l (2 lb/gal) Volatile Organic Compound (VOC) liberating solvents even though they are "water based." There are some water based formulations that contain less than 30 g/l but these are usually not suitable for industrial applications.

The water based paints also contain the same or similar range of heavy metals as other paints. The term "lead-free" paint means that it contains less than 600 ppm or .06% lead. A rule-of-thumb for leachability of paint sludge (either from cleanup or stripping) is 1 in 20.

All paints have varying amounts of heavy metals either as additives or through process contamination. A lead content of 500 ppm is not unusual and a Toxicity Characteristic Leaching Procedure (TCLP) test could leach as much as 25 ppm which is much greater than the "land ban" limit of 5 mg/l. Other heavy metals that might be found in paint formulations include barium and in older formulations, mercury, cadmium, chromium, and selenium could also be found.

RCRA Hazardous Constituent Concentration Limits

<u>TOXIC METAL</u> RCRA ID		<u>SLUDGE</u> (leachate from TCLP) mg/l	<u>WASTEWATER</u> mg/l
Lead	D008	5.0	5.0
Barium	D005	100.0	100.0
Mercury	D009	0.20	0.20
Cadmium	D006	1.0	1.0
Chromium	D007	5.0	5.0
Selenium	D010	5.7	1.0

Source: 40CFR268.41, Table CCWE; and 40CFR268.43, Table CCW

Paint manufacturers' literature, including their Material Safety Data Sheets (MSDS), usually do not give sufficient information to determine the concentrations of the VOCs and heavy metals. This is due in part to the constantly changing formulations to improve the product, which usually also reduces the VOCs and heavy metal content. The VOC content can be determined easily from most manufacturers' product information hot lines. The heavy metal content can vary from batch to batch and is best determined by a TCLP test of the paint sludge.

POWDER COATING

Although disposal of sludge is not usually a problem with powder coatings, some VOCs can be emitted during the curing process. The VOC emission of powder coatings is usually minimal and would only be a problem in massive operations or if other VOC emitting processes were close to the air standards allowable limit.

PAINT STRIPPING

Even though the method or vehicle used to strip a coating is not hazardous, the wastes generated might be a hazardous waste stream due to the contents of the stripped material. As indicated above, state-of-the-art industrial paint, when cured, has a potential to exhibit the characteristics of a hazardous waste. If it does exceed the characteristic limits for a hazardous waste, it must be handled, treated, and disposed of as a hazardous waste.

CONCLUSION

This discussion exposes some of the myths concerning the accomplishments of Pollution Prevention techniques in reducing VOC emissions and paint sludge hazardous wastes. This is not meant to discourage the change to water based paints, alternative strippers and stripping methods, and powder coatings.

Water based paints greatly reduce VOC emissions over conventional solvent based

paints. The cleanup is primarily water and usually does not generate a waste that is an environmental concern, if disposed of as a wastewater rather than a hazardous waste (Chemical Oxygen Demand (COD) may be a problem for some discharges to Publicly Owned Treatment Works (POTW)). The VOCs that are emitted are reportedly less injurious to health and less offensive to employees in the area.

Powder coatings almost eliminate VOCs and are reportedly a superior coating system in terms of durability, reducing wastes, and cost.

Although possibly still producing a hazardous waste, "Non-hazardous" stripping methods greatly reduce the total toxicity, volume, and types of toxics generated. They also usually improve worker health conditions during the operation.